



# PATENT

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Chuong Diep
Serial No.	:	10/623,409
Filed	:	July 18, 2003
Title	:	SWITCH ASSEMBLY
Art Unit	:	2832
Examiner	:	Marina Fishman
Attorney Docket No.	:	EC-6458
Confirmation No.	:	5003

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P.O. Box 1450  
Alexandria, VA 22313-1450

## APPEAL BRIEF

Sir:

This appeal brief is in response to the final rejection mailed October 1, 2004. The Notice of Appeal was filed on January 7, 2005. A request for a one month extension of time in which to file this Appeal Brief is enclosed herewith. A check for \$500.00 to cover the fee for filing a brief in support of an appeal is enclosed herewith.

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**I. REAL PARTY IN INTEREST**

This application has been assigned to Eaton Corporation. The assignment was recorded in the U.S. Patent and Trademark Office on July 18, 2003 at Reel 014322, Frame 0537.

**II. RELATED APPEALS AND INTERFERENCES**

Applicant is not aware of any prior or pending appeals, interferences, or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the appeal for this application Serial No. 10/623,409.

**III. STATUS OF THE CLAIMS**

The status of all of the claims in this proceeding is as follows:

- (1) Claims 1 – 11, 27 and 28 have been finally rejected.
- (2) Claims 12 through 26 have been cancelled.

The final rejection of claims 1 – 11, 27 and 28 is being appealed.

**IV. STATUS OF AMENDMENTS**

All amendments have been entered. No amendment has been filed subsequent to the final rejection.

**V. SUMMARY OF CLAIMED SUBJECT MATTER**

A switch assembly 10 constructed in accordance with the present invention is illustrated schematically in Figs. 1 and 2 in an unactuated condition. The switch

assembly 10 includes a housing 12. An array 14 of switch contacts is disposed adjacent to the lower portion of the housing 12 (page 6, lines 16 – 20 of the specification).

The switch mechanism 16 is operable between a first condition (Fig. 1) and a second condition (Fig. 4) to effect operation of an array of switch contacts 14 between an unactuated condition (Fig. 1) and an actuated condition (Fig. 4). The array 14 of switch contacts is connected with an array 22 of switch terminals. The switch actuation mechanism 16 is of the snap action type (page 7, lines 2 – 8 of the specification).

When a push button 24 is manually depressed (Fig. 3), a force transmitting apparatus 26 is effective to transmit force to the snap action type switch mechanism 16 (Figs. 1, 2, and 4). The force transmitted from the push button 24 to the force transmitting apparatus 26 causes the switch actuation mechanism 16 to operate the contacts from the unactuated condition of Fig. 1 to the actuated condition of Fig. 4 with a snap action. When the switch actuation mechanism 16 is released by the force transmitting apparatus 26, the switch actuation mechanism is effective to operate the switch contacts from the actuated condition of Fig. 4 back to the unactuated condition of Fig. 1 with a snap action (page 7, lines 10 – 19 of the specification).

The force transmitting apparatus 26 (Fig. 5) includes a cam block 78. An upper force transmitting pin 80 extends upward from the cam block 78. The upper force transmitting pin 80 is connected with the push button 24. In addition to the cam block 78 and upper force transmitting pin 80, the force transmitting apparatus

26 includes a lower force transmitting pin 82. The lower force transmitting pin 82 transmits force from the cam block 78 to the snap action type switch actuation mechanism 16 (Fig. 1) (page 13, lines 3 – 9 of the specification).

In order to minimize the number of components and the weight of the switch assembly 10, the force transmitting apparatus 26 is integrally formed as one piece of polymeric material. It is contemplated that the force transmitting apparatus 26 may be formed by molding polymeric material with a configuration corresponding to the configuration of the cam block 78, upper force transmitting pin 80 and lower force transmitting pin 82. Alternatively, the force transmitting apparatus 26 may be cut from a single block of polymeric material (page 14, lines 19 – 21 and page 15, lines 1 – 5 of the specification).

By forming the cam block 78 and force transmitting pins 80 and 82 as one piece, the operational reliability of the switch assembly 10 is increased and the cost of the switch assembly is decreased. A build up of tolerances between the force transmitting pins 80 and 82 and the cam block 78 is avoided. An increase in tolerances due to wear of tooling used to form the force transmitting pins 80 and 82 and the cam block 78 is avoided. In addition, installation of the force transmitting pins 80 and 82 and cam block in the switch assembly 10 during construction of the switch assembly is facilitated by integrally forming the force transmitting pins 80 and 82 and cam block 78 as one piece (page 15, lines 6 – 15 of the specification).

The upper force transmitting pin 80 has an upper end portion 92 (Fig. 5) which is connected with a bottom wall 90 of the push button 24 (Fig. 6). In order

to facilitate connection of the upper end portion 92 of the upper force transmitting pin 80 with the push button 24, a snap connection is provided to interconnect the push button and upper force transmitting pin. The snap connection is formed between an annular groove 96 (Fig. 5) in the upper end portion 92 of the force transmitting pin 80 and the opening 98 disposed on a lower side of the push button 24 (Fig. 6). The opening 98 on the lower side of the push button 24 is formed by an annular array 102 of flanges 104 (page 15, lines 19 – 21, and page 16, lines 1 – 3 of the specification).

By forming the push button 24 separately from the force transmitting pin 80, any one of several different push buttons may be snapped onto the force transmitting pin. This enables postponement of a decision as to which push button 24 is to be used with a particular switch assembly 10. Therefore, the switch assembly can be easily customized by selection of a push button 24 having desired indicia and/or arrangement of light sources until shortly before the switch assembly is to be supplied to a user of the switch assembly (page 17, lines 18 – 21 and page 18, lines 1 – 5 of the specification).

A cam track 112 (Fig. 5) is formed in the cam block 78. The cam track 112 has a generally heart shaped configuration and includes an inner cam surface 114 and an outer cam surface 116. The cam surfaces 114 and 116 are integrally formed as one piece with the cam block 78 (page 18, lines 6 – 9 of the specification).

The cam track 112 is engaged by a cam follower 122 (Figs. 1 – 3 and 7). The cam follower 122 is integrally formed as one piece and includes a helical

main section 124 (Figs. 1, 2, and 7). The helical main section 124 has a cylindrical central passage 128 (Fig. 7) into which a cylindrical support pin 130 extends. The support pin 130 is integrally formed as one piece with a side wall 132 of an inner casing or housing 136 (page 18, lines 19 – 21 and page 19, lines 1 – 3 of the specification).

The cam follower 122 is formed as a torsion spring from one piece of wire. Thus, a suitable metal spring wire is bent to form the main section 124, base arm 142 and follower arm 152. As initially formed, the base arm 142 and follower arm 152 are angularly offset from each other by an angle which is greater than when the cam follower 122 is mounted in the switch assembly (Fig. 2) (page 20, lines 4 – 9 of the specification).

The cam follower 122 cooperates with the cam track 112 to hold the force transmitting apparatus 26 and push button 24 in the actuated condition illustrated in Fig. 3. At this time, the end section 154 of the cam follower arm 152 of the cam follower 122 (Fig. 7) engages a cusp in the inner cam surface 114 (Fig. 3 and 5) to hold the force transmitting apparatus 26 and push button 24 in their actuated positions (page 21, line 7 – 12 of the specification).

The snap action type switch actuation mechanism 16 includes an upper actuator member 170 (Figs. 1, 4, and 8) and a lower actuator member 172. The upper actuator member 170 is engaged by the lower force transmitting pin 182 of the force transmitting apparatus 26 (Figs. 1 and 4). The lower actuator member 172 is connected with the L-shaped connector member 18 (page 23, lines 12 – 16 of the specification).

The upper actuator member 170 (Fig. 8) includes a pair of cylindrical bearing sections 182 and 184. The bearing sections 182 and 184 are disposed in a coaxial relationship and have the same size and configuration. A generally T-shaped main section 188 is formed as one piece with bearing sections 182 and 184. The bearing sections 182 and 184 extend in opposite directions from the main section 188 (page 24, lines 1 – 6 of the specification).

By forming the main section 188 and bearing sections 182 and 184 of the snap action type switch actuation mechanism 16 as one piece, the operational reliability of the switch assembly 10 is increased and the cost of the switch assembly is decreased. A build-up of tolerances between the main section 188 and bearing sections 182 and 184 is avoided. In addition, installation of the main section 188 and bearing sections 182 and 184 in the switch assembly 10 during construction of the switch assembly is facilitated by forming the main section and bearing sections as one piece (page 24, lines 15 – 20 and page 25, lines 1 and 2 of the specification).

The main section 208 (Fig. 8) of the lower actuator member 172 defines a generally rectangular opening 218. The arms 210 and 212 are spaced apart by a distance which is greater than the length of the cross section 192 on the upper actuator member 170. Therefore, the main section 188 on the upper actuator member 170 can move through the opening 218 formed by the main section 208 of the lower actuator member 172 (page 25, lines 19 – 21 and page 26, lines 1 – 3 of the specification).

The upper actuator member 170 is integrally formed from a single piece of polymeric material. Similarly, the lower actuator member 172 is integrally formed from a single piece of polymeric material. The bearing sections 182 and 184 on the upper actuator member are formed by rolling polymeric material forming the upper actuator member. Similarly, the bearing sections 200 and 202 on the lower actuator member 172 are formed by rolling polymeric material of the lower actuator member (page 27, lines 5 – 11 of the specification).

By forming the actuator members 170 and 172 as a single piece of polymeric material, the number of components of the switch assembly is minimized. In addition, by forming the upper and lower actuator members 170 and 172 of polymeric material, the weight of the switch assembly 10 tends to be minimized (page 27, lines 12 – 16 of the specification).

A printed circuit 250 (Fig. 9) extends between terminals 252 in the array of switch terminals and the push button 24 (Fig. 1). The push button 24 includes a display which is illuminated by a plurality of solid state light sources. The solid state light sources are energized by electrical energy conducted through the printed circuit 250 to illuminate the display (page 32, lines 4 – 8 of the specification).

The printed circuit 250 (Fig. 9) includes a main section 258 which extends between the push button 24 and the base 62 of the switch assembly 10. The main section 258 of the printed circuit 250 includes a pair of arm sections 262 and 264. The main section 258 has a lower (as viewed in Fig. 9) end portion 268. Electrical conductors in the lower end portion 268 are connected with the



terminals 252 and the array 14 of switch contacts (page 32, lines 15 – 20 of the specification).

A flexible zig-zag portion 276 of the main section 258 extends between the upper end portion 270 and the intermediate portion 274 of the main section of the printed circuit (Fig. 9). Electrical conductors on legs 280 and 282 of the zig-zag portion 276 connect the upper end portion 270 with the intermediate portion 274 of the printed circuit 250. The flexible zig-zag portion 276 of the main section 258 of the printed circuit 250 enables the push button 24 and upper end portion 270 of the printed circuit 250 to easily move relative to the intermediate portion 274 of the printed circuit during movement of the push button 24 relative to the housing 12 (page 33, lines 9 – 17 of the specification).

The arm sections 262 and 264 of the printed circuit 250 (Fig. 9) are mirror images of each other and have the same general construction and configuration. Thus, the arm sections 262 and 264 include side portions 286 and 288 which extend parallel to each other and perpendicular to the intermediate portion 274 of the main section 258 of the printed circuit 250. In addition, the arm sections 252 and 254 include front flaps 290 and 292 which extend parallel to the intermediate portion 274 of the main section 258 and perpendicular to the side portions 286 and 288 of the arm sections. The front flaps 290 and 292 are electrically connected to the intermediate portions 274 of the main section 258 of the printed circuit by electrical conductors which extend from the front flaps through the side portions 286 and 288 to the intermediate portion 274 (page 33, lines 18 – 21 and page 34, lines 1 – 8 of the specification).

The main section 258 of the printed circuit 250 has a flat rectangular outer side surface 310 which faces toward the rear wall 302 and is spaced a slight distance from the rear wall (Fig. 1). Electrical circuit components, indicated schematically at 312 in Fig. 9, are disposed on the outer side surface 310 of the intermediate portion 274 of the printed circuit 250. The electrical components 312 are exposed adjacent to the rear wall 302 of the housing 12 to facilitate heat transfer from the electrical circuit components to the rear wall of the housing (page 34, lines 18 – 21 and page 35, lines 1 – 4 of the specification).

Similarly, the front flaps 290 and 292 (Fig. 9) are disposed adjacent to the front wall 300 (Fig. 1) of the housing 12. Electrical circuit components on the sides of the front flaps 290 and 292 (Fig. 9) face toward the front wall 300. The electrical circuit components on the front flaps 290 and 292 are disposed in close proximity to the front wall 300 of the housing 12 to promote heat transfer from these electrical circuit components to the metal front wall of the housing (page 35, lines 5 – 11 of the specification).

**VI. GROUNDS OF REJECTION TO  
BE REVIEWED ON APPEAL**

Claims 1 – 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens [U.S. 3,315,535] in view of Olson [U.S. 4,001,526]. When making the final rejection of claim 1, the Examiner made the following statements:

Regarding Claim 1, Stevens discloses the instant claimed invention except for the cam block and the first and second force transmitting pins being formed as one piece. It would have been

obvious to one having ordinary skill in the art at the time the invention was made to make two parts into integral unit, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. [Howard v. Detroit Stove Works, 150 U.S. 164 (1893).] (See page 3 (last line) and page 4 of the final rejection dated October 1, 2004.) (emphasis added)

When making the final rejection of claims 2 and 3, the Examiner made the following statements:

Regarding Claims 2 and 3, Stevens discloses first and second actuator members [26, 24], are pivoted, [Figures 2 and 3; Column 2, line 15]. The second actuating member [24] is disclosed with a pin (not numbered), which is connected to the housing [Figure 1] and hence the second actuating member is provided with third and fourth bearing surfaces about a second axis (of the supporting pin, not numbered, Figure 3), similarly, since the pivoting action for the first actuating member, it would have been obvious to provide first and second bearing surfaces for the first actuating member and also provide a pin with a first axis onto which the first and second bearing surfaces of the first actuating member can be supported so as to obtain the pivoting of the first actuating member. (See page 3 of the final rejection dated October 1, 2004).

When making the final rejection of claim 4, the Examiner made the following statement:

Regarding Claim 4, Stevens discloses the instant claimed invention except for a groove on the force transmitting pin and flange on the push button. Olson [Figures 1 and 2] discloses a force transmitting pin [36] with grooves (not numbered) and body of the push button [38] with resilient projecting flanges (not numbered). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide groove for pin 54 of Stevens and also provide resilient projecting flanges in the body of push button as taught by Olson, so that the push button and the first pin can be removably connected. (See page 4 of the final rejection dated October 1, 2004) (emphasis added)

When making the final rejection of claims 5 and 6, the Examiner made the following statements:

Regarding Claims 5 and 6, Stevens [Figure 8] discloses a support pin [132] extending from a bottom wall of the casing. The cam follower has a base arm [80, 72'], a helical coil [130] and a follower arm [102'], which engages the cam surface [110, 114]. Also the main section [74'] and follower section [102'] are perpendicular to each other. However, the end of the base section is not parallel to the end of the follower arm. Embodiment of Figure 7 discloses a portion of the base section parallel to the end of the

follower section. Therefore, it would have been an obvious matter of design choice to provide the end section of the base section parallel to the end section of the follower arm. (See page 3 of the final rejection dated October 1, 2004) (emphasis added)

In addition, the Examiner rejected claims 7 – 11, 16, 17 and 26 under 35 U.S.C. 103(a) as being unpatentable over Stevens [U.S. 3,315,535] in view of Olson [U.S. 4,001,526] as applied to claim 1 above, further in view of Hart [U.S. 5,659,162]. In rejecting claims 7 – 11, 16, 17 and 26 the Examiner made the following statement:

Regarding Claims 7 – 11, 27 and 28, Stevens and Olson disclose the instant claimed invention, however, both do not disclose a printed circuit connecting to a plurality of light sources. Hart discloses a plurality of light sources and a printed circuit connecting the light source to a plurality of switch terminals. It would have been obvious to one of ordinary skill in the art to provide a printed circuit to connect terminals of the switch to the plurality of light sources as taught by Hart, so that the switch button is illuminated and signal is provided from the terminals to the light sources.

Regarding Claims 8, 27 and 28, though Hart does not disclose the circuit board having an opening, providing opening for passing the pin, would be a an (sic) obvious matter of design choice. For Claim 9, the traces on the printed circuit are taken as

components, alternatively the LED of Hart reference can be taken as circuit components. For Claims 10 and 11, Hart discloses end portions of the circuit board connected to the switch contacts and the push buttons. Though the Hart reference does not disclose arm sections of the circuit board, it would have been a matter of choice to provide arm sections running along side walls of the housing, so that the circuit board can be properly supported in the housing.

(See page 5 of the final rejection dated October 1, 2004.)

(emphasis added)

**Comment**

In the final rejection, the Examiner rejected claim 26, which has been cancelled, and did not reject claims 27 and 28. (See the first three lines of page 5 of the final rejection dated October 1, 2004). Although claims 27 and 28 were not rejected, it is apparent from the remarks that were made in conjunction with the rejection that the Examiner intended to reject claims 27 and 28, under 35 U.S.C. 103(a) as being unpatentable over the patents to Stevens, Olson and Hart. Therefore, claims 27 and 28 will be treated herein as having been rejected as being unpatentable over these three references.

**VII. ARGUMENT**

**Independent  
Claim 1**

Independent claim 1 is directed to an assembly which includes contacts which are operable between actuated and unactuated conditions. A switch

actuation mechanism is operable between first and second conditions to effect operation of the switch contacts between the actuated and unactuated conditions. A cam block has a surface with a first portion which is engageable by a cam follower when the switch contacts are in the unactuated condition and a second portion which is engaged by the cam follower when the switch contacts are in the actuated condition.

In addition, claim 1 sets forth a first force transmitting pin as extending between a push button and a cam block to transmit force from the push button to the cam block. A second force transmitting pin extends between the cam block and a switch actuation member to transmit force from the cam block to the switch actuation member. The cam block and first and second force transmitting pins are integrally formed as one piece.

In rejecting claim 1 as being unpatentable over a combination of the patents to Stevens (3,315,535) and Olson (4,001,526), the Examiner made the following statement:

Regarding Claim 1, Stevens discloses the instant claimed invention except for the cam block and the first and second force transmitting pins being formed as one piece. (See page 4 of the final rejection dated October 1, 2004.) (emphasis added)

In the patent to Stevens (3,315,534), the force transmitting pin 54 (Figs. 1, 2, and 3) is riveted to the sheet metal lens retainer 56. The force transmitting pin 54 is formed separately from the cam block 86 and guide pin 96 of Fig. 6 of

Stevens. An end portion of the force transmitting pin 54 is telescopically received in the opening 92 in the cam block 86 (see Figs. 5 and 6 of the patent to Stevens).

As was admitted by the Examiner, the patent to Stevens clearly contemplates that the force transmitting pin 54 will be formed separately from the cam block 86 and guide pin 96 (see the sentence spanning pages 3 and 4 of the final rejection of October 1, 2004). The Examiner then goes on to state that it would be obvious to make the force transmitting pin 54 and cam block 86 of Stevens as one piece.

If the pin 54, cam block 86 and pin 96 of Stevens were integrally formed as one piece, in the manner suggested by the Examiner, it would be impossible to assemble the switch mechanism of Stevens. This is because the pin 54 extends through the lamp board 46 of Stevens (see Figs. 1, 2 and 3 of the patent to Stevens). If the cam block 86 was integrally formed as one piece with the force transmitting pin 54 of Stevens, the cam block could not be positioned in the switch mechanism of Stevens, in the manner illustrated in Figs. 1 – 3 of the patent to Stevens.

Exhibit A is an enlarged marked up copy of Fig. 2 of the patent to Stevens. In Exhibit A, the force transmitting pin 54, cam block 86 and guide pin 96 of Stevens have been colored red. The lamp board 46 of Stevens has been colored blue. The force transmitting pin 54 is riveted to the sheet metal retainer 56 (see column 2, lines 41 – 46 of Stevens). The force transmitting pin 54 (colored red in Exhibit A) extends through the lamp board 46 (colored blue in Exhibit A). The



lens retainer 56 is disposed above the lamp board 46. The cam block 86 is disposed below the lamp board.

In order to assemble the switch mechanism of Stevens, it is necessary to telescopically insert the force transmitting pin 54 (colored red in Exhibit A) through the opening 52 in the lamp board 46 (colored blue in Exhibit A). If the force transmitting pin 54 is integrally formed as one piece with the cam block 86, in the manner required by claim 1, it would be impossible to move the force transmitting pin 54 and cam block 86 of Stevens through the opening 52 in the lamp board 46. Therefore, it would be impossible to assemble the switch mechanism of Stevens.

If the switch mechanism of Stevens was assembled and the pin 54 and cam block “made integral by simply use of a bonding material”, as suggested by the Examiner at page 6 of the final rejection, it would be impossible to gain access to the lamps 44 on the lamp board 46 of Stevens without ripping the switch mechanism of Stevens apart. This is because the metal retainer 56 of Stevens is fixedly connected to one end of the pin 54 and the cam block would be fixedly connected to the other end of the pin 54. Therefore, the sheet metal retainer 56 of Stevens could not be withdrawn from the housing 36 to gain access to the lamps 44 to enable a defective lamp to be replaced.

In the absence of applicant’s disclosure, there is no reason to form the pin 54, cam block 86 and pin 96 of Stevens as one piece in the manner set forth in claim 1. This is because if the pin 54, cam block 86 and pin 96 of Stevens were integrally formed as one piece it would be impossible to: (1) assemble the switch mechanism of Stevens and (2) service the lamps 44 of Stevens.

It is respectfully requested that the Examiner indicate where there is any suggestion in the prior art of forming the pin 54, cam block 86 and pin 96 of Stevens as one piece so that it would be impossible to assemble the switch mechanism or service the lamps in the switch mechanism. If the Examiner fails to point out where these concepts are suggested by the prior art, it is respectfully requested that the Board of Appeals consider this failure to be an admission by the Examiner that the prior art does not disclose or suggest forming the pin 54, cam block 86 and pin 96 of Stevens as one piece.

In the final rejection, the Examiner has suggested that the pin 54 of Stevens could be connected with the cam block 86 and pin 96 by bonding them together. Thus, in the final rejection the Examiner made the following statement in regard to the patent to Stevens:

Also, after assembly, the pins could be made integral by simply use (sic) of a bonding material. (see page 6 of the final rejection dated October 1, 2004).

There is absolutely no reason why anyone would bond the pin 54 to the cam block 86 and pin 96 of Stevens in a manner which would prevent assembly of the switch mechanism of Stevens and would prevent servicing of the switch assembly.

It is respectfully requested that the Examiner indicate where there is even the slightest suggestion in the patent to Stevens of bonding the pin 54 to the cam block 58. If the Examiner fails to point out where the patent to Stevens suggests bonding the pin 54 to the cam block 58, it is respectfully requested that the Board

of Appeals consider failure to be an admission by the Examiner that the prior art does not suggest this concept.

**Dependent**

**Claim 2**

Claim 2 depends from claim 1 and defines over the prior art, particularly the patents to Stevens and Olson, for substantially the same reasons as does claim 1 and by virtue of the structure and function set forth in claim 2 taken in combination with the structure and function of claim 1. Specifically, claim 2 sets forth the switch mechanism as including first and second actuator members. The first actuator member is set forth in claim 2 as including a first main section and first and second bearing sections integrally formed as one piece. The second actuator member includes a second main section and third and fourth bearing sections integrally formed as one piece.

Claim 2 was rejected as being unpatentable over the patent to Stevens (3,315,535) in view of the patent to Olson (4,001,526). In the patent to Stevens, the switch button actuator 24 and actuating arm 26 (Figs. 2 and 3 of Stevens) do not have bearing sections which are integrally formed as one piece with main sections of the switch button actuator and actuating arm. Even more specifically, the switch button actuator 24 and actuating arm 26 of Stevens do not have cylindrical bearing surfaces which extend from the main sections to support the button actuator 24 and actuating arm 26 in the manner set forth in claim 2. In fact, the button actuator 24 and actuating arm 26 of Stevens do not even have bearing

surfaces which extend from main sections of the switch button actuator and actuating arm.

**Dependent  
Claim 3**

Claim 3 depends from claim 2 and sets forth the switch actuation mechanism as being a snap action mechanism. The first actuator member is formed by a first piece of polymeric material. The second actuator member is formed by a second piece of polymeric material.

Claim 3 was rejected and being unpatentable over a combination of the patents to Stevens (3,315,535) and Olson (4,001,526). In rejecting claim 3, the Examiner made the following statement:

Regarding Claim 3, Stevens discloses the instant claimed invention except for the first and second members [26, 24] being formed of first and second pieces of polymeric material. (See page 4 of the final rejection dated October 1, 2004) (emphasis added)

Thus, the Examiner has admitted that the patent to Stevens does not disclose actuator members formed of polymeric material.

By forming each of the actuator members 170 and 172 (Fig. 8 of the present application) of polymeric materials and forming the main sections and bearing sections as one piece, the operational reliability of the switch assembly is increased and the cost of the switch assembly is decreased. A build up of tolerances between the main section and bearing sections is avoided. In addition, installation of the actuator members in the switch assembly during construction of

the switch assembly is facilitated since each of the actuator members is formed as one piece. By forming the actuator members 170 and 172 of polymeric material, their weight is minimized to promote rapid switch actuation.

**Dependent  
Claim 4**

Claim 4 depends from claim 1 and sets forth an annular groove in the end portion of the force transmitting pin. A flange is connected with a push button. The flange is disposed in engagement with the groove in the end portion of the force transmitting pin to interconnect the push button and the force transmitting pin.

In rejecting claim 4, the Examiner made the following statement:

Regarding Claim 4, Stevens discloses the instant claimed invention except for the groove in the force transmitting pin and flange on the push button. Olson [Figures 1 and 2] discloses a force-transmitting pin [36] with a groove (not numbered) and body of the push button [38] with resilient projecting flanges (not numbered). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to provide groove for pin [54] of Stevens and also provide resilient projecting flanges in the body of the push button as taught by Olson, so that the push button and the first pin can be removably connected. (see page 4 of the final rejection dated October 1, 2004) (emphasis added)

There is no reason to have a push button of Stevens releasably connected with the pin 54 in the manner suggested by the Examiner.

The patent to Stevens allows the push button to be withdrawn from the switch assembly, to provide access to the lamps 44, by merely pulling upward on the push button. Pulling upward on the push button of Stevens results in the pin 54 being moved out of the opening 92 in the cam block 86 (Fig. 6 of Stevens). Since the pin 54 of Stevens and the push button of Stevens are releasably connected with the remainder of the switch assembly, why would anyone have the push button of Stevens releasably connected with the pin 54? The Examiner's suggestion for having the push button releasably connected with the pin of Stevens must have resulted from a reading of applicant's disclosure and an attempt by the Examiner to meet the terminology of claim 4.

**Dependent  
Claim 5**

Claim 5 depends from claim 1 and sets forth a casing as being disposed within the housing. A support pin is integrally formed as one piece with a wall of the casing. The cam follower includes a helical coil section which extends around the support pin. A follower arm extends from the helical coil section into engagement with a cam surface. A base arm extends from the helical coil section and engages the casing.

In rejecting claim 5, the Examiner made the following statement:

Regarding Claims 5 and 6, Stevens [Figure 8] discloses a support pin [132] extending from a bottom wall of the casing. The

cam follower has a base arm [80, 72'], a helical coil [130] and a follower arm [102'], which engages the cam surface [110, 114].

There is nothing in the patent to Stevens disclosing a casing which is disposed within a housing and a support pin which extends outward from a wall of the casing in the manner set forth in claim 5. In addition, the patent to Stevens does not disclose a support pin which is integrally formed as one piece with a wall of a casing.

**Dependent  
Claim 6**

Claim 6 depends from claim 5 which in turn depends from claim 1. Claim 6 sets forth the follower arm as having a main section and an end section which extends perpendicular to the main section and engages the cam surface. The base arm has a main section and an end section which engages the casing. The end section of the follower arm and the end section of the base arm have central axes which extend parallel to a central axis of the support pin. The support pin is set forth in claim 5 as being integrally formed as one piece with a wall of the casing.

In rejecting claim 6, the Examiner made the following statement in regard to the patent to Stevens.

However, the end of the base section is not parallel to the end of the follower arm. Embodiment of Figure 7 discloses a portion of base section parallel to follower section. Therefore, it would have been an obvious matter of design choice to provide the end section of the

base section parallel to end section of the follower arm. (see page 3 of the final rejection dated October 1, 2004) (emphasis added)

As was admitted by the Examiner, the patent to Stevens does not disclose a cam follower having a main section with: (1) an end section which extends perpendicular to the main section and engages a cam surface and (2) an end section which engages the casing which extends parallel to a central axis of a support pin which is integrally formed as one piece with the casing.

**Dependent  
Claim 7**

Claim 7 depends from claim 1 and sets forth the push button as including a plurality of solid state light sources. A printed circuit is connected with the switch contacts and the push button. A plurality of electrical circuit components are mounted on the printed circuit at a location between the push button and the switch contacts.

Claim 7 was rejected as being unpatentable over a combination of the patents to Stevens (3,315,636), Olson (4,001,526), and Hart (5,659,162). In the absence of applicant's disclosure, there is no reason to combine the various switch mechanisms disclosed in the patents to Stevens, Olson and Hart. The switch mechanism disclosed in the patent to Olson differs substantially from the mechanism shown in either the patent to Stevens or Hart. In addition, the mechanism of Hart differs from the mechanism shown in the patent to Stevens. The only suggestion for combining these diverse mechanisms must have originated from applicant's disclosure. None of the references discloses a printed



circuit which is connected with switch contacts and a push button and on which a plurality of electrical components are mounted. Furthermore, these references do not disclose a printed circuit on which electrical components are mounted at a location between a push button and switch contacts.

**Dependent  
Claim 8**

Claim 8 depends from claim 7 and sets forth the first force transmitting pin as extending through an opening formed in the printed circuit. The opening is disposed at a location between the push button and the cam block.

Even if it is assumed that it would be obvious to combine the disclosures and the patents to Stevens, Olson, and Hart, none of these references discloses a force transmitting pin which extends through an opening formed in a printed circuit at a location between a push button and a cam block. Therefore, it is clear that a combination of these references can not disclose such a concept.

It is respectfully requested that the Examiner indicate where the prior art discloses a force transmitting pin which extends through an opening formed in a printed circuit at a location between a push button and cam block in the manner set forth in claim 8. If the Examiner fails to respond to this request, it is respectfully requested that the Board of Appeals consider such a failure to be an admission by the Examiner that the prior art does not disclose a force transmitting pin which extends through an opening formed in a printed circuit at a location between a push button and a cam block in the manner set forth in claim 8.

**Dependent  
Claim 9**

Claim 9 depends from claim 7 and sets forth a printed circuit as having a first major side surface which faces toward a housing and a second major side surface which faces away from the housing. At least a portion of the electrical circuit components are disposed on the first major side surface of the printed circuit.

Claim 9 was rejected as being unpatentable over a combination of the patents to Stevens, Olson, and Hart. In the absence of applicant's disclosure there is no reason to combine these three patents disclosing different types of mechanisms in the manner suggested by the Examiner. Even if it is assumed that it would be obvious to combine the disclosures in the patents to Stevens, Olson and Hart, none of these references disclose a printed circuit having a first major side surface which faces toward a housing and a second major side surface which faces away from the housing. Furthermore, these references do not disclose electrical circuit components disposed on a printed circuit surface which faces toward the housing.

**Dependent  
Claim 10**

Claim 10 depends from claim 7 and sets forth the housing as having a plurality of side walls disposed in a rectangular array. The printed circuit includes a main section and first and second arm sections. The main section of the printed circuit has a first end portion disposed adjacent to the main switch contacts, a second end portion disposed adjacent to the push button, and an intermediate

portion which extends between the first and second end portions. The intermediate portion is disposed along a first side wall of the plurality of side walls of the housing.

The first arm section of the printed circuit is set forth in claim 10 as extending from the main section of the printed circuit and as being disposed along second and third side walls of the plurality of side walls. The second arm of the printed circuit also extends from the main section. The second arm of the printed circuit is disposed along a fourth side wall of the plurality of side walls and it is disposed along the third side wall of the plurality of side walls.

Claim 10 was rejected as being unpatentable over the combination of the patents to Stevens, Olson, and Hart. As is previously discussed herein, in the absence of applicant's disclosure, there is no reason to combine the various mechanisms disclosed in these three patents.

Even if it is assumed that it would be obvious to combine the disclosures in the patents to Steven, Olson and Hart in a manner which is not even remotely suggested by the patents, none of these references discloses the printed circuit having:

- (1) a main section
- (2) first and second arm sections which extend from the main section and are disposed along side walls of the housing.

The patent to Hart discloses a printed circuit 56 (Fig. 2). However, the printed circuit of Hart does not have first and second arm sections which extend from a

main section of the printed circuit and are disposed along side walls of a housing in the manner set forth in claim 10.

The Examiner is hereby challenged to indicated where the prior art discloses even the slightest suggestion of a printed circuit having: a main section and first and second arm sections which extend from the main section and are disposed along side walls of the housing. If the Examiner fails to respond to this direct challenge, it is respectfully requested that the Board of Appeals consider such a failure to be an admission that the subject matter of claim 10 is not disclosed in the prior art.

**Dependent**  
**Claim 11**

Claim 11 depends from claim 10 and sets forth a first portion of the electrical circuit components as being mounted on the intermediate portion of the main section of the printed circuit. A second portion of the electrical circuit components are mounted on the first arm of the printed circuit. A third portion of the electrical circuit components are mounted on the second arm.

Claim 11 was rejected as being unpatentable over a combination of the patents to Stevens, Olson and Hart. However, none of these references disclose a printed circuit having first and second arm sections extending from a main section of the printed circuit in the manner set forth in claim 10 from which claim 11 depends. Furthermore, none of these references discloses electrical circuit components as being mounted on: (1) an intermediate portion of the main section of the printed circuit, (2) a first arm section of the printed circuit, and (3) a second

arm section of the printed circuit. The patents to Stevens, Olson and Hart do not disclose a printed circuit having a main section and first and second arm sections in the manner set forth in claim 11. Therefore, it is believed to be clear that the prior art does not disclose mounting of circuit components on the main section and arm sections of a printed circuit in the manner set forth in claim 11.

**Independent  
Claim 27**

Claim 27 is directed to an assembly which includes switch contacts at least partially disposed in a housing. The assembly is operable between first and second conditions to effect operation of the switch contacts between actuated and unactuated conditions. A manually movable push button includes a plurality of light sources which are connected with the push button for movement relative to the housing.

A force transmitting apparatus is set forth in claim 27 as extending between the push button and the switch actuation mechanism to transmit force to the switch actuation mechanism. The printed circuit is set forth in claim 27 as being connected with the switch contacts and the light sources. The printed circuit includes a flexible portion which is deflected by movement of the push button. The flexible portion of the printed circuit includes an opening through which the force transmitting apparatus extends.

Claim 27 defines over the prior art, and particularly the patents to Stevens, Olson and Hart, by setting forth the printed circuit having a flexible portion which includes an opening through which a force transmitting apparatus extends. The

patent to Hart discloses a printed circuit 56 having a flexible or zig-zag portion 76. However, the patent to Hart does not disclose a printed circuit with a flexible portion having an opening through which a force transmitting apparatus extends. In the patent to Hart, the L-shaped actuator member 140 (see Fig. 2 of the patent to Hart) is offset to one side of the printed circuit 56. The actuator member 140 of Hart does not extend through an opening in the printed circuit in the manner set forth in claim 27.

It is respectfully requested that the Examiner indicate where the patents to Stevens, Olson and/or Hart disclose a printed circuit having a flexible portion with an opening through which a force transmitting apparatus extends in the manner set forth in claim 27. If the Examiner fails to respond to this request, it is respectfully requested that the Board of Appeals consider such a failure to be an admission by the Examiner that the prior art does not disclose a printed circuit having a flexible portion with an opening through which a force transmitting apparatus extends in the manner set forth in claim 27.

**Dependent  
Claim 28**

Claim 28 depends from claim 27 and sets forth the force transmitting apparatus as including a first force transmitting pin connected with the push button. A cam block is integrally formed as one piece with: (1) the first force transmitting pin and (2) a second force transmitting pin. The first and second force transmitting pins and the cam block are movable relative to the housing

under the influence of force transmitted from the push button to effect operation of the switch actuation mechanism.

Claim 28 defines over the prior art, and particularly the patents to Stevens, Olson and Hart, by setting forth a cam block which is integrally formed as one piece with first and second force transmitting pins. In the patent to Stevens, the cam block 86 (Fig. 6) is not integrally formed as one piece with the pin 54 (Figs. 1 – 3). In addition, the force transmitting pins and cam block do not extend through an opening in a flexible portion in a printed circuit in the manner set forth in claim 27 from which claim 28 depends.

The Examiner is hereby challenged to indicate where the prior art discloses a force transmitting apparatus which extends through an opening in a flexible portion of a printed circuit and wherein the force transmitting apparatus includes a cam block which is integrally formed as one piece with first and second force transmitting pins. If the Examiner does not respond to this direct challenge, it is respectfully requested that the Board consider this failure to be an admission by the Examiner that the prior art does not disclose such an apparatus.

## **VIII. CONCLUSION**

### **Summary**

There are two independent claims involved in this appeal. That is claims 1 and 27. Claim 1 defines over the prior art by setting forth the cam block and first and second force transmitting pins which are integrally formed as one piece. The patent to Stevens discloses a cam block 86 which is formed separately from a force transmitting pin 54. It would not be obvious to form the pin 54 and cam

block 86 of Stevens as one piece. This is because forming the cam block and pin of Stevens as one piece would make the apparatus of Stevens impossible to assemble. Forming the pin and cam block of Stevens as one piece would also make it impossible to gain access to the lamps 44 of Stevens to service the lamps.

Independent claim 27 sets forth a printed circuit as having a flexible portion. The flexible portion of the printed circuit includes an opening through which a force transmitting apparatus extends. The patent to Hart discloses a printed circuit having a flexible portion. However, the patent to Hart does not disclose or even remotely suggest providing the flexible portion of the printed circuit with an opening through which a force transmitting apparatus extends.

### **Challenges**

The Examiner was directly challenged, on pages 28 of this appeal brief, to indicate where the prior art discloses a printed circuit having:

- (1) a main section and
- (2) first and second arm sections which extend from the main section  
and are disposed along side walls of the housing

in the manner set forth in claim 10. If the Examiner fails to respond to this direct challenge, it is respectfully requested that the Board of Appeals consider this failure to be an admission that the apparatus of claim 10 is not disclosed in the prior art.

The Examiner was also directly challenged on page 31 of this appeal brief, to indicate where the prior art discloses a printed circuit having a flexible portion



with an opening through which a force transmitting apparatus extends in the manner set forth in claim 27. If the Examiner fails to respond to this direct challenge, it is respectfully requested that the Board of Appeals consider this failure to be an admission that the apparatus of claim 27 is not disclosed in the prior art.

In view of the foregoing remarks, it is respectfully requested that the claims in this application be allowed.

**IX. APPENDIX A**

Appendix contains a copy of the claims involved in this appeal. There is no evidence appendix. There is no related proceedings appendix.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Calvin G. Covell", written over a horizontal line.

Calvin G. Covell  
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CUSTOMER NUMBER: 26,294

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**APPENDIX A**

1. An assembly comprising a housing, switch contacts at least partially disposed in said housing and operable between actuated and unactuated conditions, a switch actuation mechanism at least partially disposed in said housing, said switch actuation mechanism being operable between first and second conditions to effect operation of said switch contacts between the actuated and unactuated conditions, a cam follower at least partially disposed in said housing, a cam block having a cam surface with a first portion which is engaged by said cam follower when said switch contacts are in the unactuated condition and a second portion which is engaged by said cam follower when said switch contacts are in the actuated condition, a manually movable push button, a first force transmitting pin extending between said push button and said cam block to transmit force from said push button to said cam block, and a second force transmitting pin extending between said cam block and said switch actuation mechanism to transmit force from said cam block to said switch actuation mechanism, said cam block and said first and second force transmitting pins being integrally formed as one piece.

2. An assembly as set forth in claim 1 wherein said switch actuation mechanism includes a first actuator member, said first actuator member includes a first main section and first and second bearing sections having cylindrical bearing surfaces extending from said first main section to support said first actuator member for pivotal movement relative to said housing about a first axis which is coincident with central axes of said first and second cylindrical bearing

surfaces, said first main section and said first and second bearing sections being integrally formed as one piece, a second actuator member, said second actuator member includes a second main section and third and fourth bearing sections having cylindrical bearing surfaces extending from said second main section to support said second actuator member for pivotal movement relative to said housing about a second axis which is coincident with central axes of said third and fourth cylindrical bearing surfaces, said second main section and said third and fourth bearing sections being integrally formed as one piece, and a spring extending between said first and second actuator members, said spring being effective to press said first main section of said first actuator member against said second force transmitting pin, said spring being effective to apply force against said second actuator member to pivot said second actuator member about said second axis during pivotal movement of said first actuator member about said first axis.

3. An assembly as set forth in claim 2 wherein said switch actuation mechanism is a snap action mechanism which effects operation of said switch contacts between the actuated and unactuated conditions with a snap action, said first actuator member being formed by a first piece of polymeric material, said second actuator member being formed by a second piece of polymeric material.

4. An assembly as set forth in claim 1 further including an annular groove in an end portion of said first force transmitting pin and a flange connected with said push button, said flange being disposed in engagement with said groove

in said end portion of said first force transmitting pin to interconnect said push button and said first force transmitting pin.

5. An assembly as set forth in claim 1 further including a casing disposed within said housing, said casing including a support pin extending outward from a wall of said casing, said support pin being integrally formed as one piece with said wall of said casing, said cam follower includes a helical coil section which extends around said support pin, a follower arm which extends from said helical coil section into engagement with said cam surface, and a base arm which extends from said helical coil section and engages said casing.

6. An assembly as set forth in claim 5 wherein said follower arm has a main section and an end section which extends perpendicular to said main section of said follower arm and engages said cam surface, said base arm has a main section and an end section which engages said casing, said end section of said follower arm and said end section of said base arm having central axes which extend parallel to a central axis of said support pin.

7. An assembly as set forth in claim 1 wherein said push button includes a plurality of solid state light sources which are electrically energizable to provide illumination, said assembly further includes a printed circuit connected with said switch contacts and said push button, and a plurality of electrical circuit components mounted on said printed circuit at a location between said push button and said switch contacts.

8. An assembly as set forth in claim 7 wherein said first force transmitting pin extends through an opening formed in said printed circuit at a location between said push button and said cam block.

9. An assembly as set forth in claim 7 wherein said printed circuit has a first major side surface which faces toward said housing and a second major side surface which faces away from said housing, at least a portion said electrical circuit components being disposed on said first major side surface of said printed circuit.

10. An assembly as set forth in claim 7 wherein said housing has a plurality of side walls disposed in a rectangular array, said printed circuit includes a main section and first and second arm sections, said main section of said printed circuit having a first end portion disposed adjacent to said switch contacts, a second end portion which is disposed adjacent to said push button and an intermediate portion which extends between said first and second end portions and is disposed along a first side wall of said plurality of side walls of said housing, said first arm section of said printed circuit extends from said main section of said printed circuit and is disposed along second and third side walls of said plurality of side walls, said second arm section of said printed circuit extends from said main section of said printed circuit and is disposed along a fourth side wall of said plurality of side walls and is disposed along said third side wall of said plurality of side walls.

11. An assembly as set forth in claim 10 wherein a first portion of said electrical circuit components are mounted on said intermediate portion of said

main section of said printed circuit, a second portion of said electrical circuit components are mounted on said first arm section of said printed circuit, and a third portion of said electrical circuit components are mounted on said second arm section of said printed circuit.

27. An assembly comprising a housing, switch contacts at least partially disposed in said housing and operable between actuated and unactuated conditions, a switch actuation mechanism at least partially disposed in said housing, said switch actuation mechanism being operable between first and second conditions to effect operation of said switch contacts between the actuated and unactuated conditions, a manually movable push button, said manually engageable push button includes a plurality of light sources which are connected with said push button for movement with said push button relative to said housing, a force transmitting apparatus extending between said push button and said switch actuation mechanism to transmit force to said switch actuation mechanism, and a printed circuit connected with said switch contacts and said light sources, said printed circuit includes a flexible portion which is deflected by movement of said push button, said flexible portion of said printed circuit includes an opening through which said force transmitting apparatus extends.

28. An assembly as set forth in claim 27 wherein said force transmitting apparatus includes a first force transmitting pin connected with push button, a second force transmitting pin, and a cam block integrally formed as one piece with said first and second force transmitting pins, said first and second force transmitting pins and said cam block being movable relative to said housing under

the influence of force transmitted from said push button to effect operation of said switch actuation mechanism.